

SYNTAX ZX80[®]

A PUBLICATION OF THE HARVARD GROUP

VOL. 1 NO. 1 REPRINT

ISSN 0273-2696

1980

NEW ZX80 ROM AND RAM SOON

Soon you will be able to upgrade your ZX80 to competitive high level computing power. Sinclair Research, Ltd., has developed a new 8K BASIC ROM. You simply pull out your present 4K ROM chip and drop in the new 8K chip. When it becomes available, it will cost \$40 and come with a keyboard template showing the 37 additional functions and a supplemental operating manual. See the comparison chart, center pages, for a list of features.

Additionally, the new ROM provides graph plotting capability, animated displays, and named programs on cassette.

Although Sinclair announced the new ROM in England in September, no chips have been manufactured. Backlogged orders in England for the ZX80 have caused delays in production of the 8K ROM, according to Katie Manchester of Sinclair. When the units are available, they will be sold exclusively at first to ZX80 owners by mail from Sinclair. However, US owners may have to wait longer than UK customers.

We are also expecting a new 16K dynamic RAM memory expansion to plug into the wide connector on the ZX80. Although you already have 1K inside the ZX80, the 16K RAM disables the 1K, giving you 16K effective memory. Again, production is delayed, this time by the FCC, but new RAMs should be available first quarter, 1981. They will run under \$100.

FROM SINCLAIR RESEARCH

The personal computer will be the most exciting product of the Eighties. Its expandability and flexibility make the computer unique. With the right hardware and software, the applications of your computer are unlimited.

The Sinclair ZX80 is the first of a new generation of personal computers—affordable yet powerful. And if you want to make the most of that power, you're going to need some help—hardware, software, information, and ideas.

That's where SYNTAX ZX80 comes in. We at Sinclair Research recognize SYNTAX ZX80 as the newsletter for the ZX80 personal computer. You'll read here first about Sinclair's expanding range of ZX80 personal computer products, and all the ZX80 news from independent manufacturers, software publishers and users.

We can't succeed without a strong network of people to support the ZX80. We welcome the contribution that SYNTAX ZX80—and you the readers—will make.

Nigel H. Searle

BATTERY PACK CASE

Check Herbach & Rademan's summer bulletin (Vol. 46 No. 5). Stock # 21K731 (\$4.50) holds 8 C size cells and needs rewiring and a new output connector. H&R is in Philadelphia (215/426-1700).

If you use alkaline C cells, Eveready E-93 or equal, you can operate 2½ to 6 hours.

DIFFERENT STROKES

Prestodigitizer, an 8-bit input graphics tablet available for several micros, will soon be ready for your ZX80. According to Dave Thornburg, president of Innovision, you can expect the new peripheral almost simultaneously with Sinclair's 8K BASIC ROM.

Using this device, you write on the pad and standard characters appear on the screen. You can also do simple stroke graphics on the screen. Handicapped users and children find this input mode especially useful.

For printed character input, you'll need at least a 3K memory expansion to contain the learning, recognition and stroke dictionary routines. Straight graphics input will work with only 1K.

Thornburg expects to offer the ZX80 tablet with a parallel input card for about \$70. He plans to offer the card—capable of recognizing any 8 switch closures—separately for \$20, but these prices are not firm.

EXHIBITIONS—A listing of shows featuring personal computers and Z-80 based hardware and software

30 October-1 November 1980--
National Small Computer Show, New
York Coliseum, New York City.

20-23 November 1980—Northeast
Computer Show, Hynes Auditorium,
Boston.

8-11 January 1981—Winter Consumer
Electronics Show, Jockey Club, Las
Vegas.

Sinclair Research will attend the
Boston and Las Vegas shows.

Nigel Searle will talk to The
Amateur Computer Group of New
Jersey on 12 December 1980. The
location is not set. Here's a
good chance for Jersey area ZX80
users to see and talk to the top
US Sinclair representative.

OUR POLICY ON CONTRIBUTED MATERIAL

SYNTAX ZX80 invites you to express opinions related to the ZX80 and the newsletter. We will print, as space allows, letters discussing items of general interest. Of course, we reserve the right to edit letters to a suitable length and to refuse publication of any material.

We welcome program listings for all levels of expertise. Programs can be for any fun or useful purpose. We will test run each one before publishing it, but we will not debug programs; please send only workable listings.

In return for your listing, we will pay you a token fee of \$2.00 per program we use. This payment gives us the nonexclusive right to use that program in any form, world-wide. This means you can still use it, sell it, or give it away, and so can we.

We will consider submissions of news and hardware or software reviews. Please keep articles short (50-100 words). Again, we reserve the right to edit accepted articles to a suitable length. We will pay 7 cents per 6 characters, including spaces and punctuation, for accepted articles.

If you want us to return your original program listing or article, please include a self-addressed, stamped envelope. Otherwise, we cannot return submitted material.

SYNTAX ZX80 is published monthly by
The Harvard Group, RD 2, Box 457, Bolton Road,
Harvard, MA 01451. Telephone 617 / 456-3661.
Subscription rates: 12 issues, \$25.
Single issues, \$4 each.

Publisher: Kirtland H. Olson

Editor: Ann L. Zevnik

Technical consultant: Eric K. Olson

© The Harvard Group, 1980. All rights reserved.
Photocopying prohibited.

CRYPTOQUOTE—USE YOUR ZX80 TO HELP YOU SOLVE SUBSTITUTION CIPHERS

"Cryptoquote" is a program for infinitely patient or just masochistic puzzle-solvers. It works just like cryptoquotes in newspapers—you substitute letters for letters to decode the babble into a quotation. Your ZX80 will help you, though, by displaying the frequency distribution of letters in your quotation. To help you more, here's the order of most commonly used letters in the English language:

ETAONRISHDLFCMUGYPWBVKXJQZ.

Run the program, then answer command with F NEWLINE (NL) to see frequency, X=L NL to substitute L for X, NL BREAK (quickly) to stop.

To change the quotation, modify line 990 to contain the new cryptoquote (find new ones in your newspaper or a puzzle book).

This program just fits in the 1K RAM. Don't choose quotations much longer than the one in line 990. Otherwise, the display will shrink as you add characters. This listing is identical to the ZX80 screen. In line 990 JQYGZKZ is one word, as is JQPMBKBQPX. We would welcome ideas for shortening or adding features to Cryptoquote.

SPECIAL HANDLING

Most of you know about the number in Boston for technical information (617/367-2555, 9-5 EST) at Sinclair Research. Now SYNTAX subscribers can get special treatment from Sinclair if you write in with requests, problems, or comments. Just write "SYNTAX ZX80" in the bottom left corner of the envelope. Nigel Searle promised us that these letters would receive immediate attention. Send letters to:

Sinclair Research Limited
50 Staniford Street
Boston, MA 02114

Do not write to the Yalesville, CT, warehouse address.

```

6 DIM T(25)
7 LET K=1000
60 FOR X=0 TO 25
65 LET T(X)=220
70 NEXT X
100 CLS
110 GO SUB 990
120 PRINT T$
123 LET X=CODE(T$)
125 IF X<38 OR X>63 THEN GO TO
170
130 PRINT CHR$(T(X-38));
140 LET T$=TL$(T$)
160 GO TO 123
170 IF X=1 THEN GO TO 200
175 PRINT CHR$(X);
180 GO TO 140
200 PRINT
205 PRINT "COMMAND:";
210 INPUT F$
220 IF CODE(TL$(F$))=227 THEN L
ET T(CODE(F$)-38)=CODE(TL$(TL$(F
$)))
222 IF F$="F" THEN GO TO 400
240 GO TO 100
400 CLS
410 GO SUB 990
460 LET N=CODE(T$)-38
470 IF N=-37 THEN GO TO 500
480 IF N<0 OR N>25 THEN GO TO 4
85
483 LET T(N)=T(N) + K
485 LET T$=TL$(T$)
490 GO TO 460
500 FOR X=0 TO 12
505 LET S=T(X)-(T(X)/K)*K
506 LET S2=T(X+13)-(T(X+13)/K)*
K
510 PRINT CHR$(X+38); "("; CHR$(S
); "):"; T(X)/K; " "; CHR$(X+51); "("
; CHR$(S2); "):"; T(X+13)/K
520 LET T(X)=S
525 LET T(X+13)=S2
530 NEXT X
540 GO TO 200
990 LET T$="UVQ JVQXZX KQ JQYG
ZKZ UBKV YWJVBPZX WJJZGKX KVZ JQ
PMBKBQPX QC XFDZLH"
999 RETURN
SYNTACTIC SUM = -1796
P.S. Answer to this one will
appear next issue.

```

COMPARISON BETWEEN THE SINCLAIR ZX80 AND THE TRS-80 POCKET COMPUTER

ITEM	SINCLAIR ZX80	TRS-80 POCKET	SINCLAIR W/8K ROM
Max size of array	mem-limit	204	mem-limit
Max # of dimensions	1	1	mem-limit
Digits of accuracy	5 integer	10 floating	9.5 floating
Range of numbers	+/- 32767	+/- 1E+99	9E-44 to 1.1E+43
Max string length	mem-limit	7	mem-limit
Max size str array	no string arrays	204	mem-limit
# of str dimensions	no string arrays	1	mem-limit
# unique var names	mem-limit	26	mem-limit
Output line width	32	24	32
Comma spacing	8	12	16
# of comma fields	4	2	2
Str data req "'s	no data stmt	no data stmt	yes
Filenames	no	yes	yes
Display size	25 x 32	1 x 24	22 x 32
Editor type	1 line scrn & list	1 line screen	1 line scrn & list
Use DEG/RAD/GRAD	none	any	rad
String concat	no	no	yes (+)
Cassette data I/O	no	yes	no
Immediate mode	yes	calculator mode	yes
Mult stmts/line	no	yes (:)	no
Uses ASCII	no	unknown	no
Display w/o stop	no	yes	yes
Kbd readable	no	no	yes
Protectable memory	no	no	yes

ARE THE FOLLOWING FUNCTIONS INCLUDED?

PEEK & POKE	X		X
USR/SYS/CALL	X		X
RND	X		X
ASC/CODE & CHR\$	X		X
STR\$	X		X
ABS & INT & SGN	ABS only	X	X
NOT & AND & OR	X	math.	X
SIN & COS		X	X
TAN & ATN		X	X
ASN & ACS		X	X
LOG/LN		both	LN
EXP & SQR/SQRT		X	X
→DEG & →DMS		X	
FRE/FREE/MEM		X	
VAL			X
LEN			X
SEG\$/MID\$ or equiv.			X
PI			X

Want to make a program unlistable?
 Just type in:
 1 REM X
 PQKE 16427,123
 To make it listable again, just
 delete line number 1.

Your ZX80 uses a character set
 that you can read by PEEKing
 locations 3584 to 4095. Each
 location contains, in binary, the
 8 dots for a row of a character.
 Read 8 bytes to make 1 symbol.

ITEM	SINCLAIR ZX80	TRS-80 POCKET	SINCLAIR W/8K ROM
------	---------------	---------------	-------------------

ARE THE FOLLOWING STATEMENTS SUPPORTED?

RANDOMIZE	X		X
PRINT USING/TO		X	X
FOR with STEP		X	X
END		X	
BEEP (make noise)		X	
GET/INKEY\$			X
PRINT AT			X
WAIT (time delay)			X
READ & DATA			X
RESTORE			X
DRAW			X
PLOT			X
UNDRAW			X
UNPLOT			X
PAUSE			X
SCROLL			X

ARE THE FOLLOWING COMMANDS SUPPORTED?

SAVE/CSAVE	X	req. I/F	X
LOAD/CLOAD	X	req. I/F	X
CLOAD?/VERIFY		req. I/F	
CHAIN/RUN <FILENAME>		req. I/F	
INPUT # (read tape)		req. I/F	
PRINT # (write tape)		req. I/F	
DEBUG/TRON (TRACE)		X	

ALL THREE MACHINES USE:

- * String comparisons in an IF statement.
- * Dynamic DIM; TRS-80 does not use DIMs.
- * Double quotes (") for literal strings.
- * Standard cassette tapes (TRS-80 only with I/F).
- * Operators +, -, *, /, and ** or uparrow.
- * LET, PRINT, INPUT, GO TO, IF...THEN, GO SUB, RETURN, FOR...NEXT, STOP, CLEAR/CLR, CLS, and REM statements.
- * RUN, CONTinue, LIST, NEW, SAVE, and LOAD commands.

NONE OF THE MACHINES USE:

- * A key to stop or slow down the output.
- * MAT statements.
- * POS, LEFT\$, or RIGHT\$ functions.
- * High speed cassette search.
- * Available printers or floppy disks.

NOTE: A / between choices indicates either fulfills category, while & indicates that both must be present. I/F means optional interface. E means scientific notation; 3E+99 equals 3*10+99.

To save data on tape, store it in an array. SAVE the program. The variables save with it, and reload when you LOAD. Start by entering GO TO XX, where XX is after your data input routine. Try GO TO 100 in Cryptoquote, for example.

KEY TO COMPARISON CHARTS

- Range of numbers—greatest and smallest no. system can express.
 - Output line width—greatest no. of characters on one output display line.
 - Comma spacing—width of comma print fields.
 - # of comma fields—no. of comma print fields across one display line.
 - Str data req "'s—do strings in data statements require quotes?
 - Editor type—what kind of editor does system use? (1 line scrn means a single line screen editor, list means listing is on screen while editing).
 - Use DEG/RAD/GRAD—how does system measure angles?

 - String concat—can system append one string to another?
 - Cassette data I/O—can system store data (as opposed to programs) on cassette tape?
 - Uses ASCII—does system use American Standard Code for Information Interchange?
 - Display w/o stop—can system display something and continue without any user interaction?
 - Display size—height and width of display in characters.
 - Kbd readable—can system read keyboard without stopping?
 - Protectable memory—can a section of memory be protected so that machine language programs may be stored there?
 - USR/SYS/CALL—all equivalent functions, transfer control to a machine language program.
 - → DEG & → DMS—convert to degrees and degrees, minutes, seconds, respectively.
 - FRE/FREE/MEM—return amount of memory not used by program.

 - RANDOMIZE—reseeds random number generator.
 - PRINT USING/TO—print no. according to a specific format.
 - FOR with STEP—extended form of a FOR...NEXT statement to specify an increment.
 - END—signals end of program.
 - BEEP—tells system to sound a beeper to notify user.
 - GET/INKEY\$—read keyboard without stopping.
 - PRINT AT—prints information at a certain screen position.
 - WAIT—pause for a certain programmable length of time.
 - READ & DATA—reads nos. or strings from list of information after DATA statement and puts it in variables.
 - RESTORE—resets data list so same data may be read in again.
 - DRAW—draws a line on screen.
 - PLOT—turns on screen pixel.
 - UNDRAW—opposite of DRAW.
 - UNPLOT—opposite of PLOT.
 - PAUSE—causes program to stop for a moment and display output.
 - SCROLL—causes all lines on screen to move up one.

 - SAVE/CSAVE—stores program on cassette tape.
 - LOAD/CLOAD—reloads program from cassette tape.
 - CLOAD?/VERIFY—compares program stored on tape to one stored in memory, to check for a good CSAVE.
 - CHAIN/RUN <FILENM>—like LOAD/CLOAD, but tells system to run program after loading.
 - INPUT #—reloads all variables in memory from tape.
 - PRINT #—stores all variables in memory on tape.
 - DEBUG/TRON (TRACE)—tells computer to display each line no. (or the line) before execution.

 - Dynamic DIM—array sizing using a variable; DIM A(G).
-
- Image Computer Products will sell dual readout, 23 pin Z-80 edge connectors in their next catalog.

TALK TO YOUR ZX80

In addition to providing more computer capability for your ZX80, the new 16K RAM will let you talk with your machine.

Cognivox, produced by Voicetek of Goleta, CA, is a speech I/O peripheral for personal computers. It uses both speech recognition and vocal response, so you and your ZX80 can talk to each other. Cognivox maintains a vocabulary of up to 32 words or short phrases (requiring less than 3 seconds of speech time) and a recognition rate up to 98%.

You must train the machine to recognize your voice and teach it a reply vocabulary. Thereafter, it will respond faithfully only to its master's voice. Cognivox learns quickly, though, and you need only pronounce the recognizer vocabulary three times and the response vocabulary once. These vocabularies may differ.

Cognivox is currently available for several personal computers. Because Voicetek aims Cognivox at a wide variety of systems, they cannot provide application programs. However, using the USR, PEEK and POKE functions, software interface to BASIC programs is simple. Supplied software includes the machine language driver programs plus application paks, as well as two voice operated video games and a talking calculator program. Additionally, Cognivox can produce music or sound effects (instructions for music programs included with manual).

The ZX80 version will require the 16K RAM memory expansion board, and Voicetek expects to deliver by March, 1981. Sinclair Research has secured marketing rights for the ZX80 Cognivox, so expect to buy it through the usual Sinclair mail order procedure. Current Z-80 Cognivoxes run \$149.

BEGINNING PROGRAMS—FOR-NEXT LOOPS

This column is dedicated to you novice programmers to whom BASIC is not so basic. (BASIC is one of the languages your ZX80 understands.) I will also try to simplify concepts in other SYNTAX features so you can get a handle on them and eventually outgrow this column.

For-next loops consist of 2 control statements, FOR..TO and NEXT. These allow you to tell the computer to do a maximum number of steps in a minimum number of commands when you need the same calculation carried out several times with different variables.

Here's such a problem: In The 12 Days of Christmas, the singer receives 1 gift the first day, 1 plus 2 more the second, and so on for 12 days. How many gifts in all? (Problem from basic basic by James S. Coan)

To solve it, you must add $1+1+2+1+2+3...+12$, adding each day's total to the grand total. Let S=subtotal for each day, T=grand total, and X=each day.

Here's the program:

```
10 LET S=0
20 LET T=0
30 FOR X=1 TO 12
40 LET S=S+X
50 LET T=T+S      SYNTACTIC SUM =
60 NEXT X          5358
70 PRINT T
```

S and T start at 0 because before day 1 there are no gifts (also you must give each number variable a starting value). X, the day number, is also the number of gifts added to the subtotal each day, 1 through 12, and this becomes the new subtotal S. At line 50 you add the subtotal to get the new grand total T. At line 60, the computer goes back to line 30 to add new gifts until X=12. Then it goes to line 70 to print the answer. You omit quotes in this statement because you want the value of T, not the letter.

OUT FRONT TO STAY

"ZX80's will be the best supported machines of their class." That's The Harvard Group's prediction for your machine, including the MicroAce kit. Here's why:

- Volume sales—nearly 4000 units in the US now.
- Software support by Image Computer Products, Inc., a major supplier to manufacturers.
- Use of the popular and widely supported Z-80 processor, also used in industrial products.
- Direct access to the processor bus via a standard connector.
- Fast, responsive service—Sinclair exchanges defective units returned for repair.
- Appealing accessories:
 - Prestodigitizer
 - Cognivox
 - expansion memories
 - 8K BASIC
 - mass storage
 - printer
- Free 10-page technical manual from Sinclair; to be available by mail before Nov. 30.
- SYNTAX ZX80—*independent news.*

LETTER FROM THE EDITOR

This is the premiere issue of SYNTAX ZX80, a newsletter devoted to the premiere of a new breed of personal computer. We aim exclusively to provide users with information and suggestions to enhance your use of Sinclair's ZX80, whether for fun or education or practical applications.

Our articles and programs will be useful to both novice and advanced users. Each issue will contain technical stories, as well as a beginner's column that will explain the ideas it presents. Additionally, the beginner's column will offer new ways to use fundamental programming. This column is written by a genuine beginning programmer, so it's sure to not be over your head.

We plan to send out a questionnaire to subscribers sometime soon to find out what your backgrounds and interests are. In the meantime, please write if you have any specific things you want to see in SYNTAX, and we will see what we can find out about them.

8

SYNTAX

THE HARVARD GROUP

Bolton Road, Harvard, Mass. 01451

NEXT MONTH
Big Keyboard
A New Micro Compared
Big Characters

CLASSIFIED ADS IN SYNTAX

Now you can buy, sell or swap plans, software or hardware with other ZX80 and MicroAce owners with SYNTAX classified ads. Reach hundreds of readers for only \$2.75 per line (minimum 4 lines). Send your ad copy, typed 35 characters per line, to Classified Ads, SYNTAX ZX80, RD 2 Box 457, Bolton Rd, Harvard, MA, 01451. Please include a check with your copy. No credit card or telephone orders. We need your ad by the 15th of any month to appear in the next month's issue. Include your name and address in each ad.